

Home Task Robots

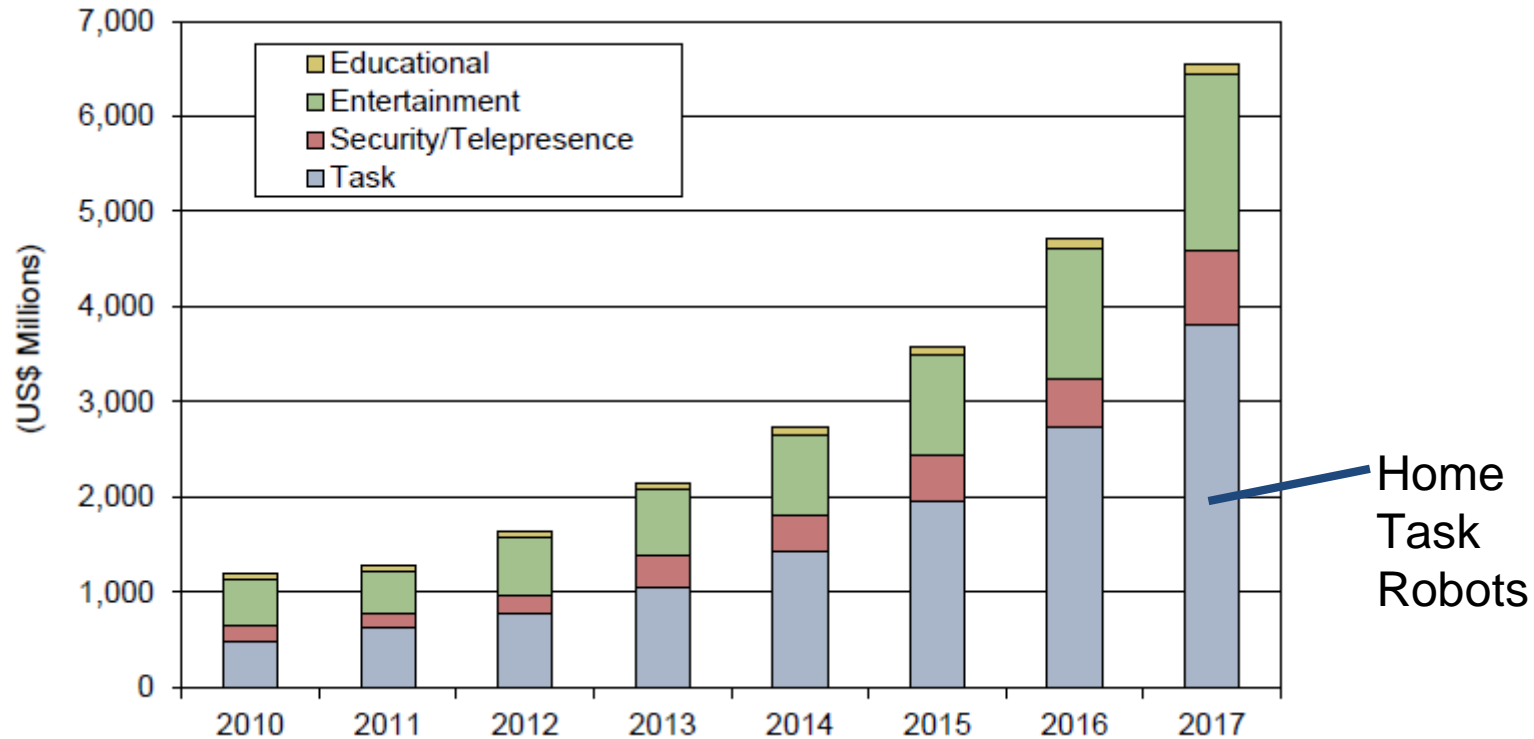
Authors: Eve Andersson, Ross Choi, Pradip Ghimire, Pelle Karlsson, Pratik Mahajan, Haripriya Rajagopal

This work was created in an open classroom environment as part of a program within the Sutardja Center for Entrepreneurship & Technology and led by Prof. Ikhlq Sidhu at UC Berkeley. There should be no proprietary information contained in this work. No information contained in this work is intended to affect or influence public relations with any firm affiliated with any of the authors. The views represented are those of the authors alone.

Hypothesis

Home task robots will start to become commonplace
in
5 years.

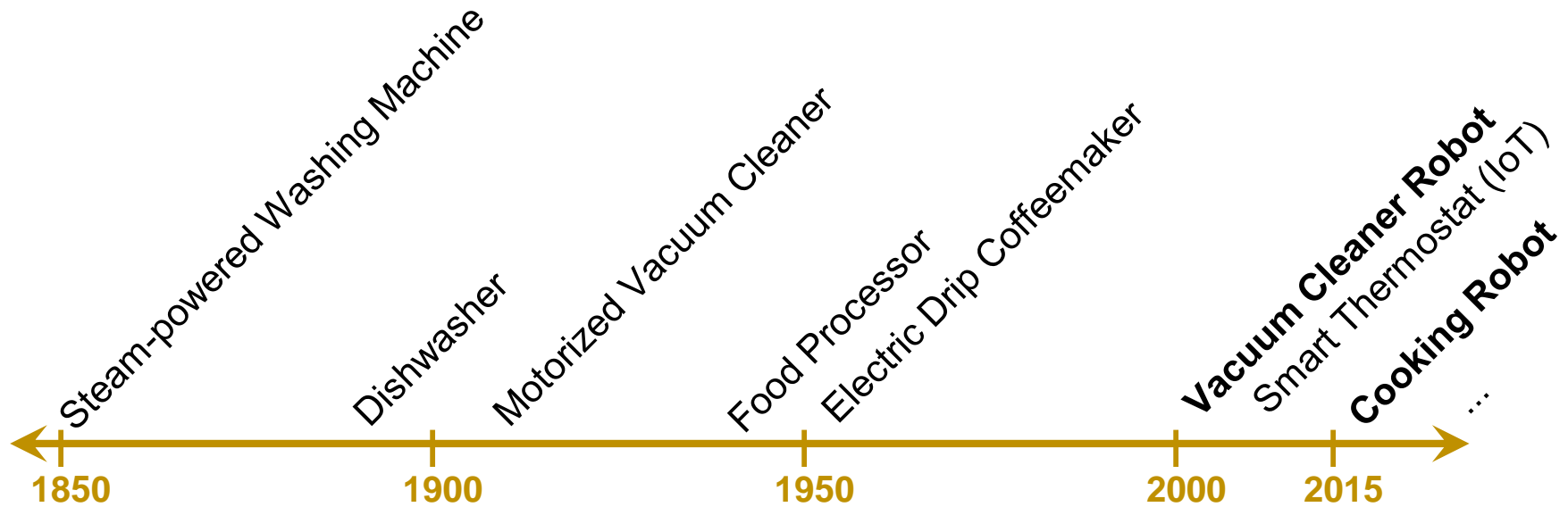
Scope



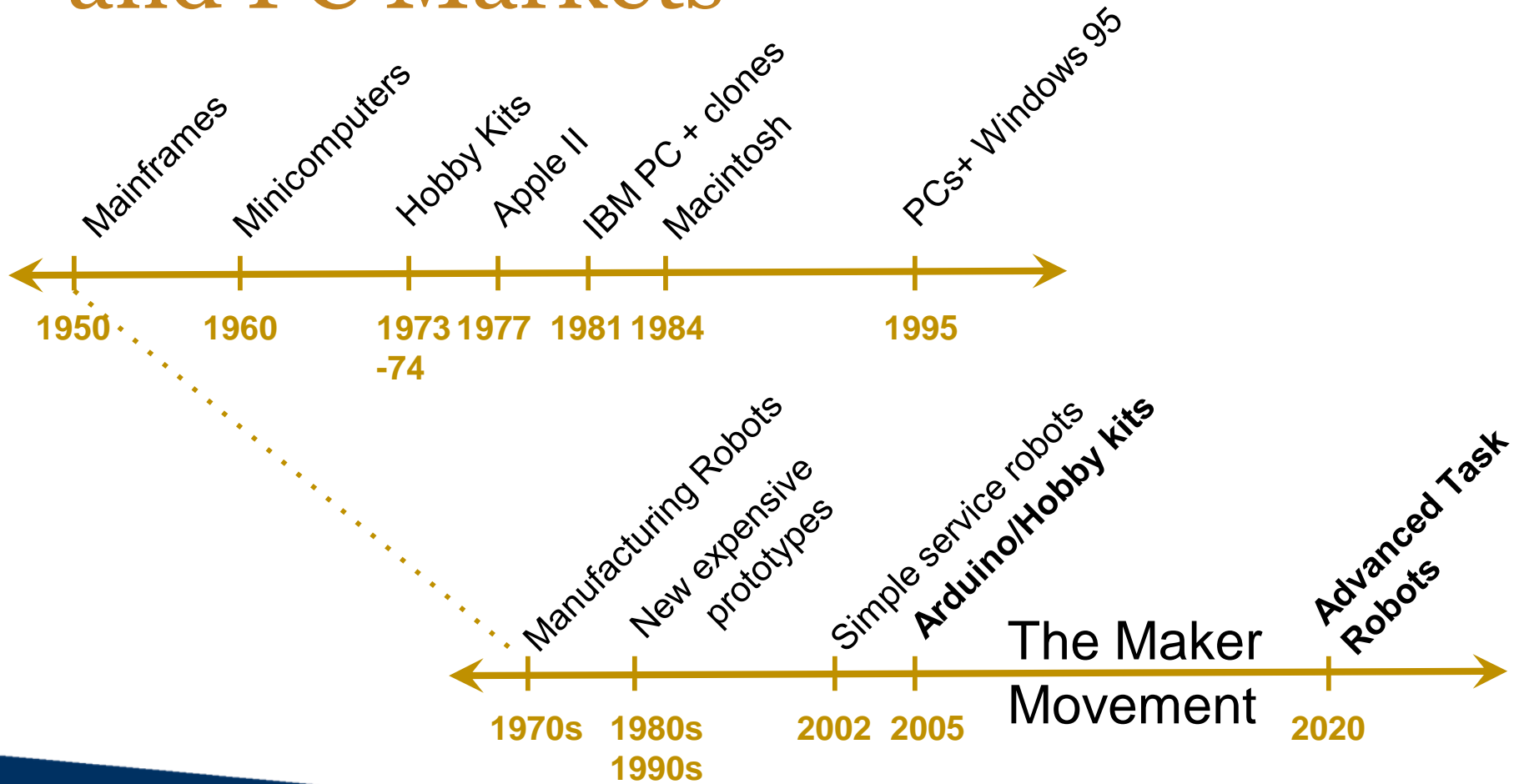
Source: ABIresearch "Consumer and personal robots", January 7, 2013

Robotics in Perspective

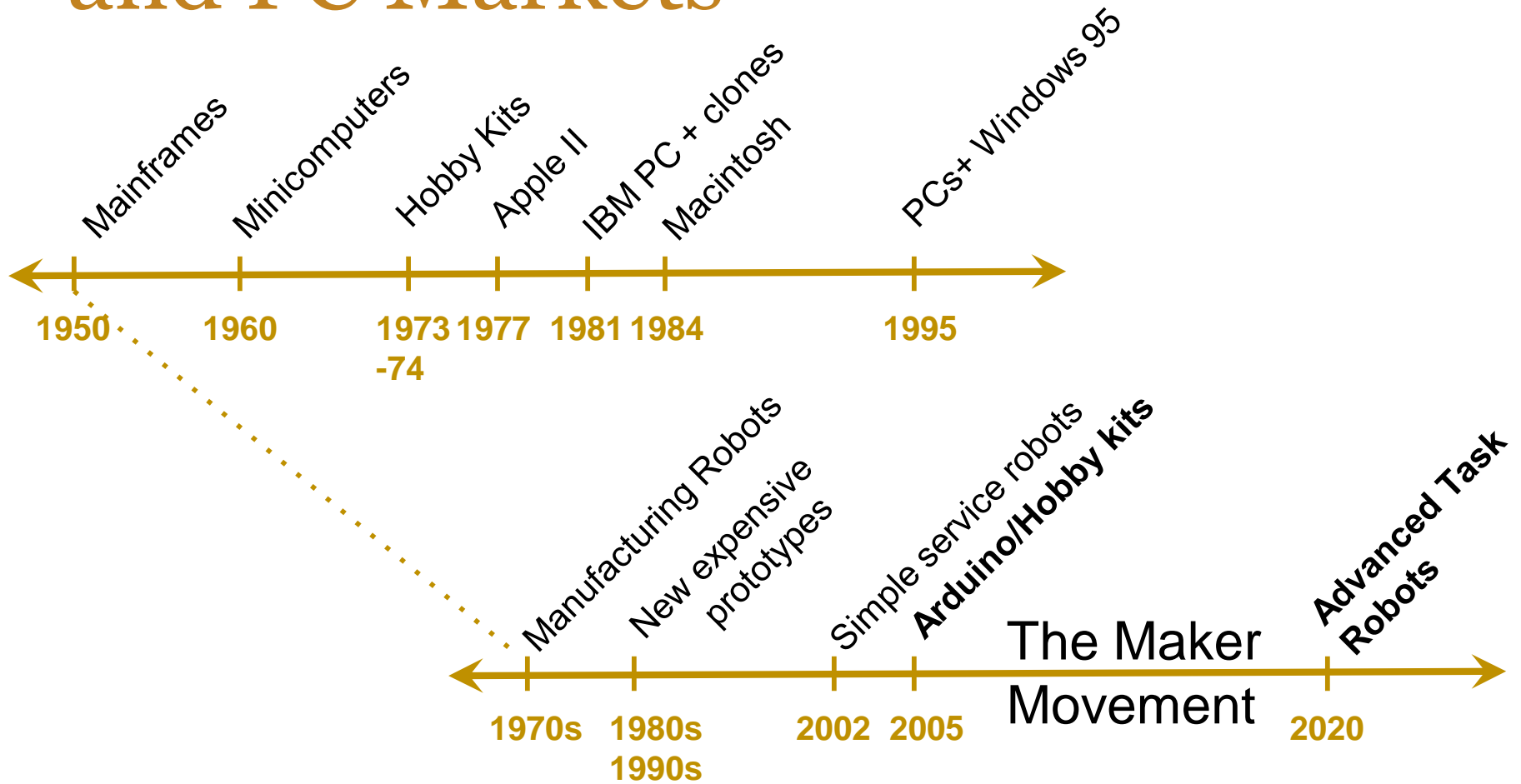
Home Task Automation



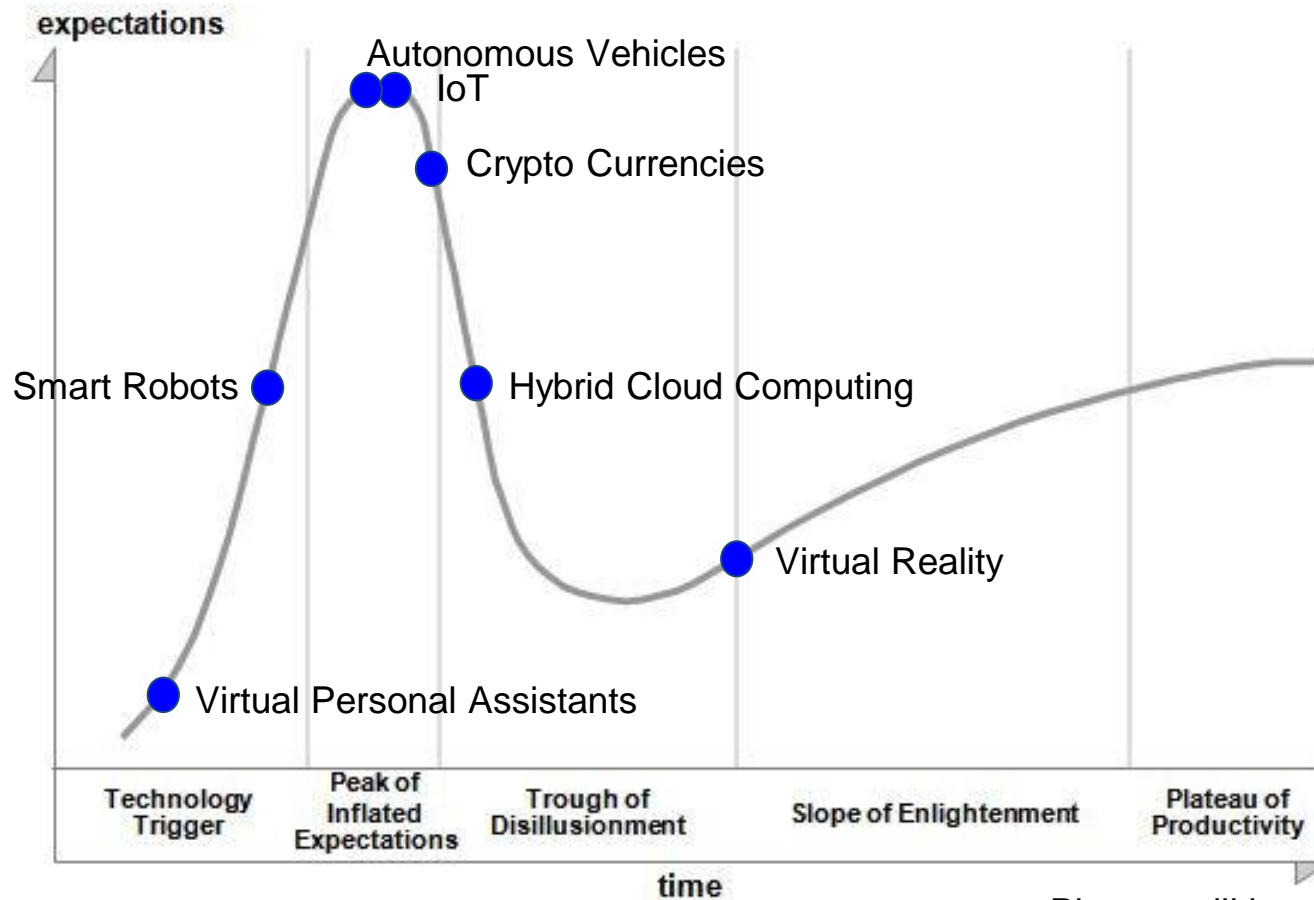
Comparison of Robotics and PC Markets



Comparison of Robotics and PC Markets



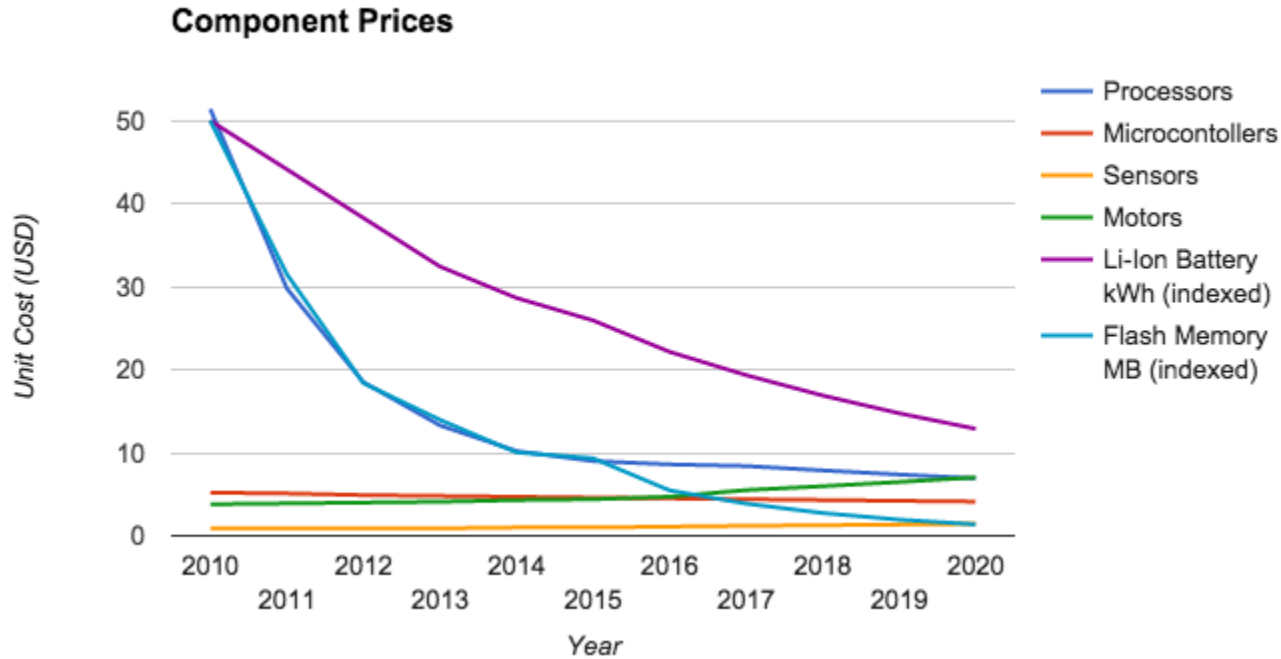
The Gartner Hype Cycle



● Plateau will be reached in 5-10 years

Technology

Components



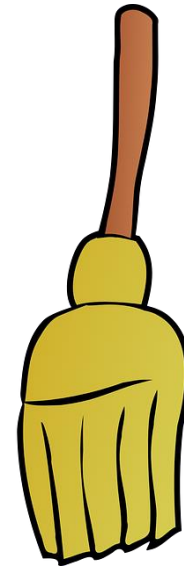
Sources: ABIresearch, Pike Research, John C. McCallum, author estimates.

Other Enablers

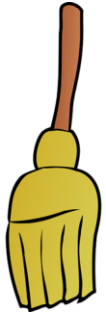
- Mobile Technologies
- Connectivity & Cloud computing
- 3D Printing
- Software (open source & APIs):
 - Mapping & Navigation
 - Machine Learning, Computer Vision
 - Manipulation and Sensor Processing
 - Speech Recognition, Natural Language Processing, Text to Speech

Cleaning & Cooking

Deep Dive



Current Players



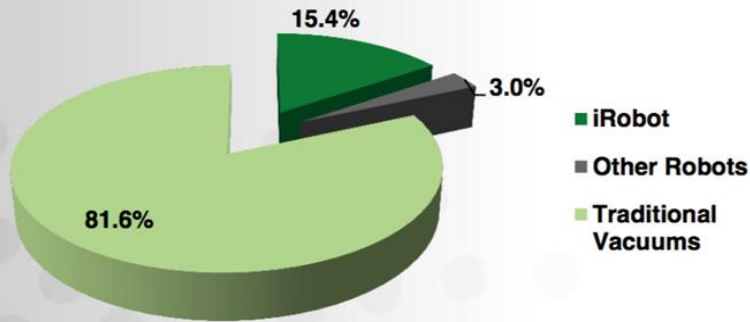
Casabots



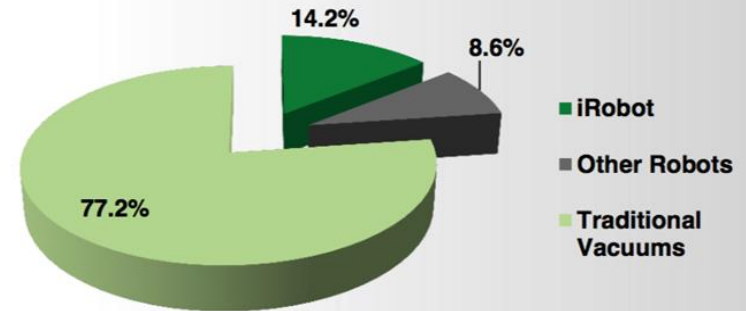


Market Opportunity

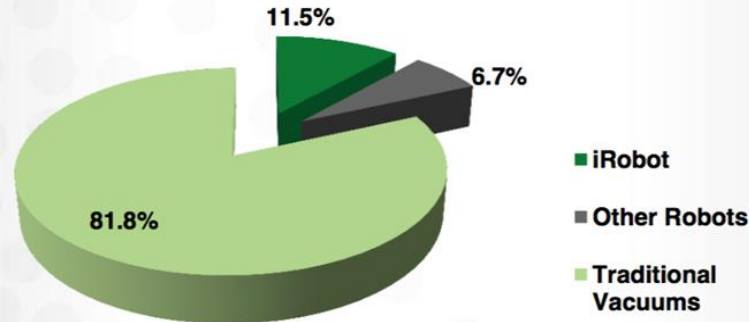
North America - \$2.3 billion



EMEA - \$2.7 billion



APAC - \$2.3 billion

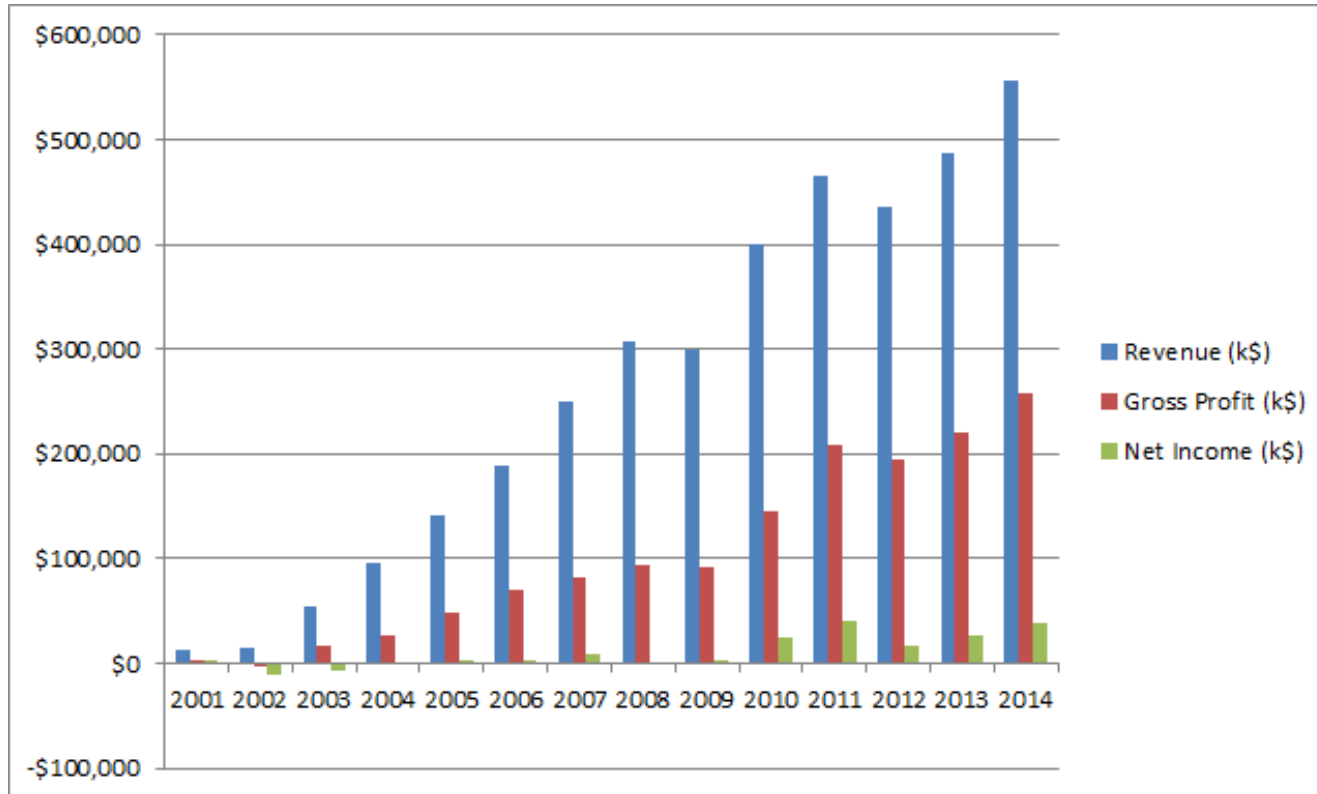


\$7.2 billion annual market opportunity

Source: Vacuum Cleaners >\$200 USD, 2014 retail prices (based on NPD, GfK, Euromonitor, iRobot internal data)



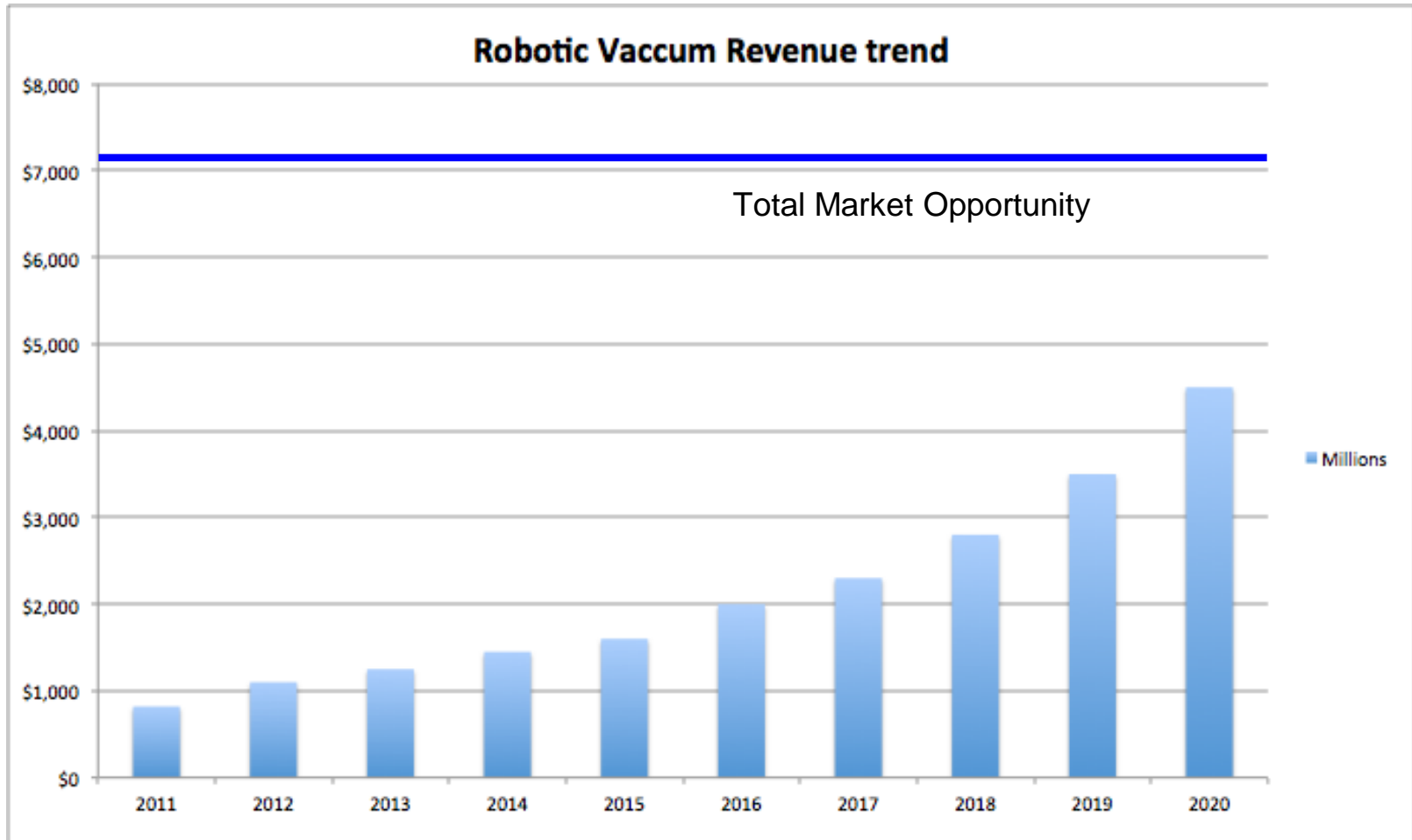
iRobot Revenue



~90% Consumer Robots



Robotic vacuums revenue





Cleaning Conclusions

- High growth market with high customer demand
- Value in automating highly mechanical chores
- Future Improvements
 - Increased reachability - Shrinking size or dual bots.
 - Reduced maintenance (self emptying, self cleaning)
 - Better mapping and room awareness.
 - Better battery life
- Winners - iRobot, Neato



Cooking Robots





Market Need

What many families do today



1-2 hours shopping every weekend

+



~1 hour to cook every day.

Wouldn't this be nice?

Automated cooking machine

Meal plan

Monday	Tuesday	Calories = 800, Vitamin: A = , B = , C =
Chicken Tikka	Braised beef short rib	

Order ingredients?



+

Automated cooking machine

Recipe for chicken tikka

1. Chop chicken
2. Add onions, cook in oil for 10 min
3. Add salt, chilli powder, turmeric
4. Cook 20 min in oil



Groceries automatically come home based on my cooking machine

Fancy dinner <5 min. of my time every day.



Total Addressable Market

- Hardware price tag ~ \$600
- If household income > \$72k per year,
0.6% of yearly income = \$600





Cooking Conclusions

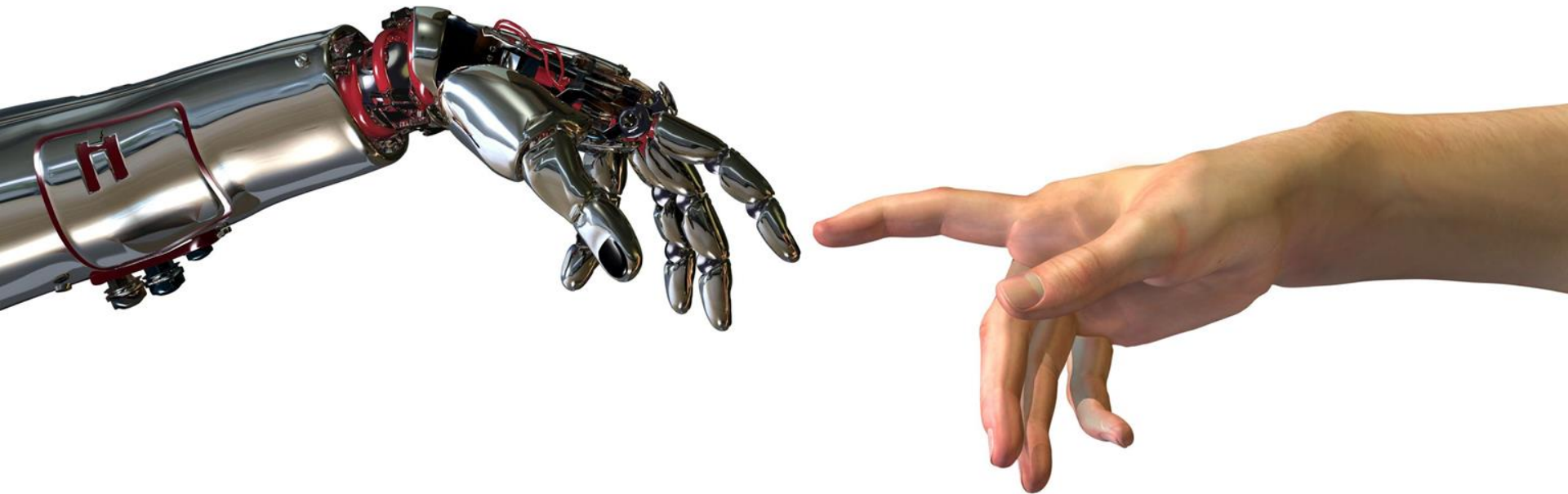
- No entrants have yet proven themselves - nascent market
- Competitive differentiation based on features and kinds of food cooked
- Possibility of new entrants taking over

Societal Factors

Family Dynamics



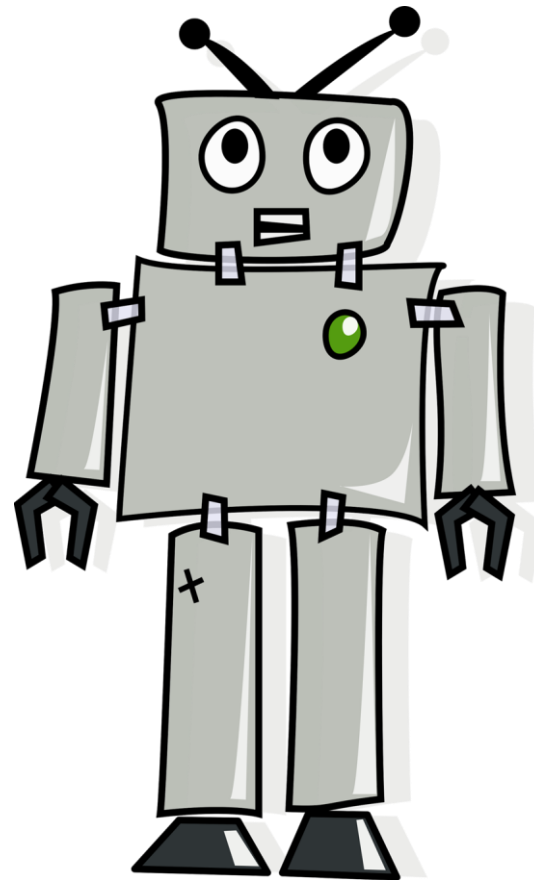
Acceptance of Robots



Effect on Job Market



Fear of AI



Conclusion

Predictions

Task robots will start to become commonplace in 5 years.

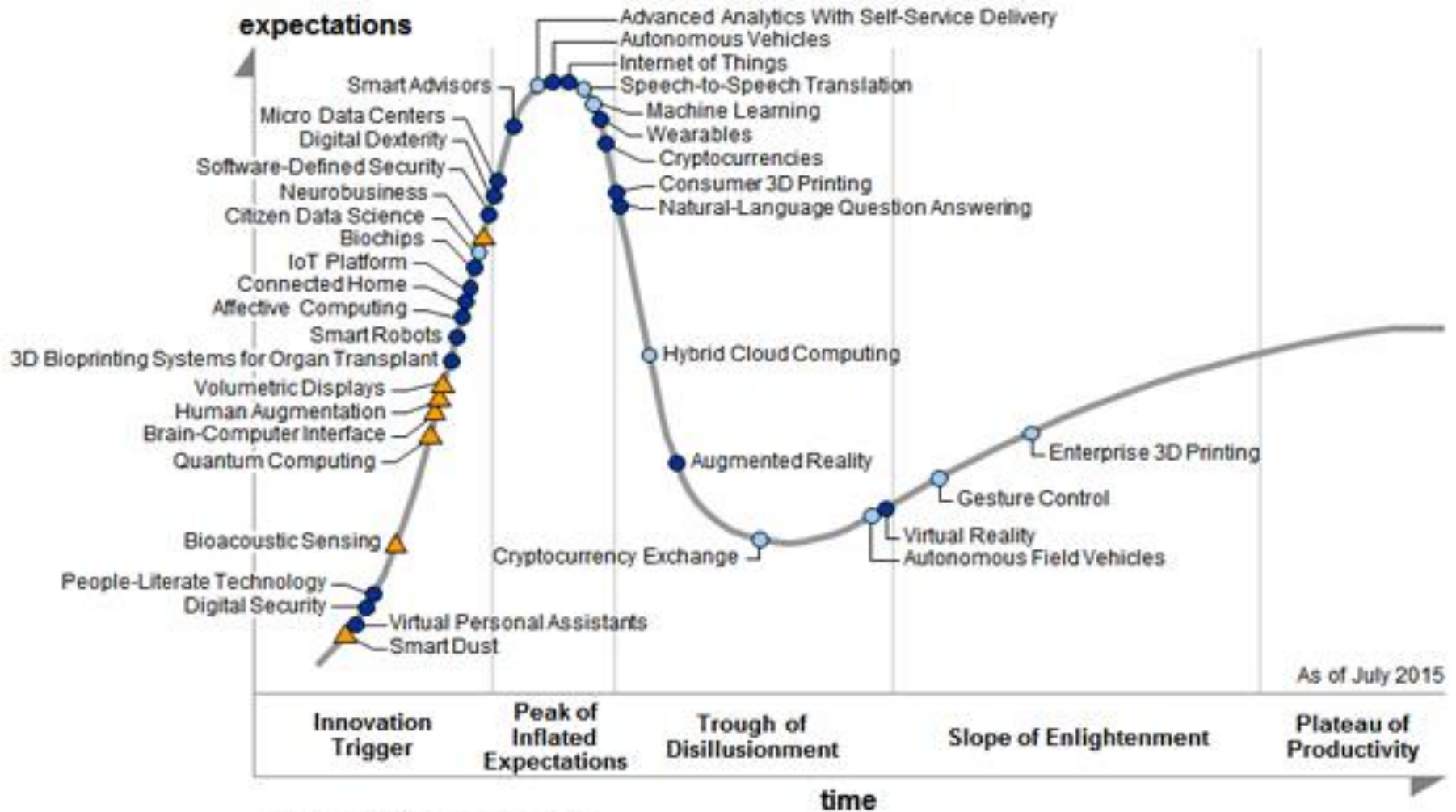
Cleaning will lead the way.

Food market will start to grow over next 5 years.

Market is ripe for new entrants to take over.

Appendix

The Gartner Hype Cycle



Plateau will be reached in:

○ less than 2 years

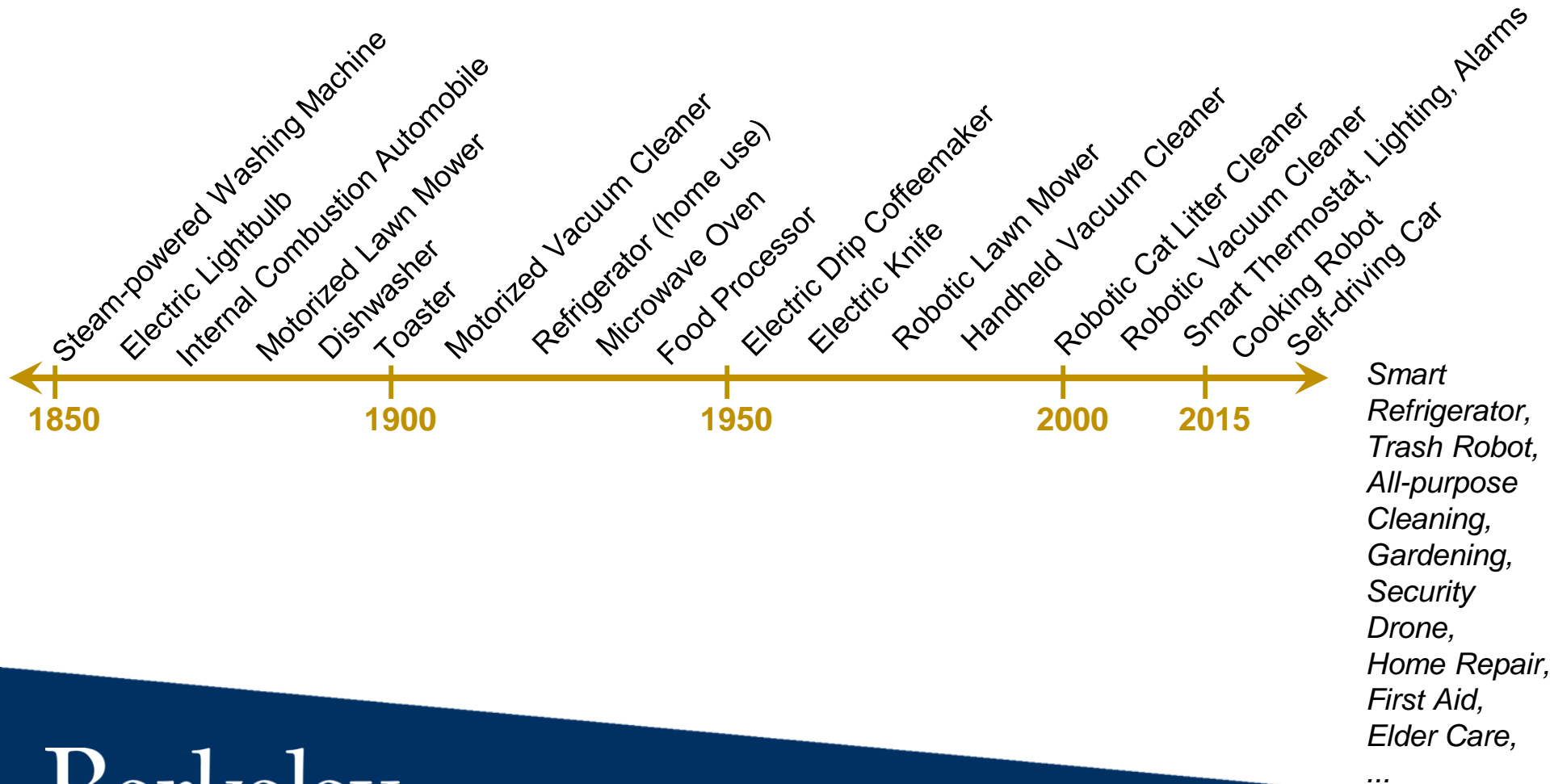
○ 2 to 5 years

● 5 to 10 years

▲ more than 10 years

○ obsolete before plateau

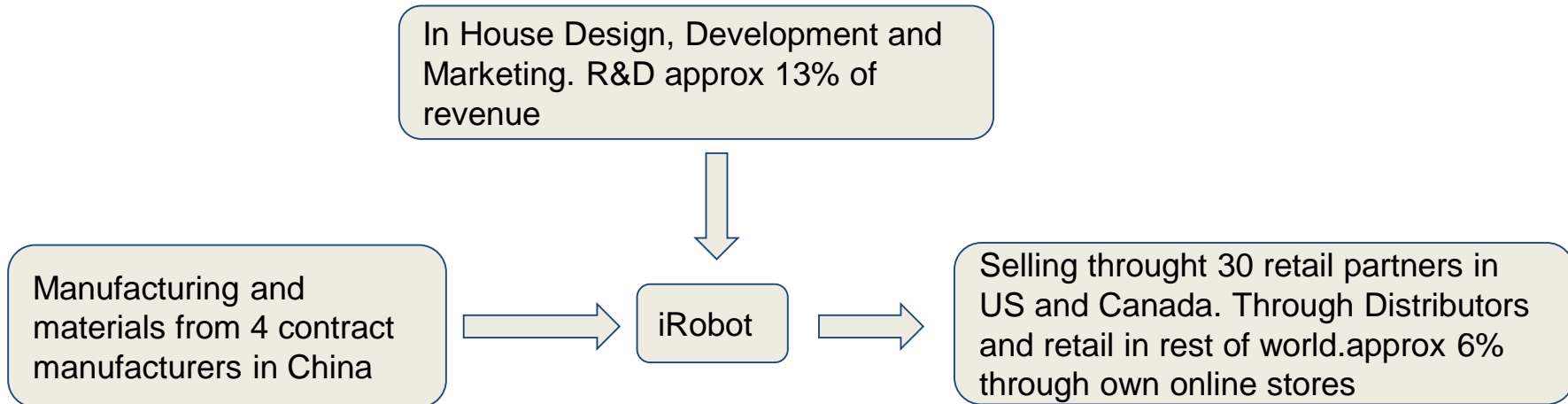
Task Automation



Cleaning: Product Features

- Roomba - Automated vacuum cleaning robot
- Scooba - Floor Mopping Robot
- Braava - Swimming pool cleaning robot
- Verro - Gutter cleaning robot
- Looj - Gutter cleaning robot

Environment



Scope

Including:

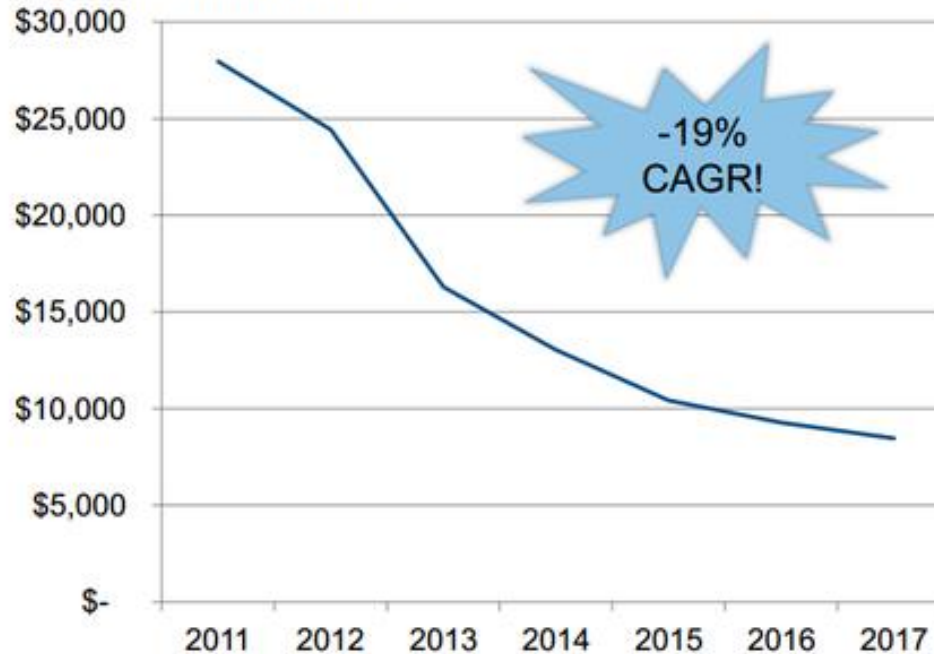
- Floor Cleaning
- Food

Excluding:

- Gardening
- Social
- Security/surveillance
- Outside home

Worldwide 3D printer ASV Trend

Average Selling Value



- Price ranges from sub-\$1,000 to seven figures
- Customers indicate short ROI after 3D printer investment



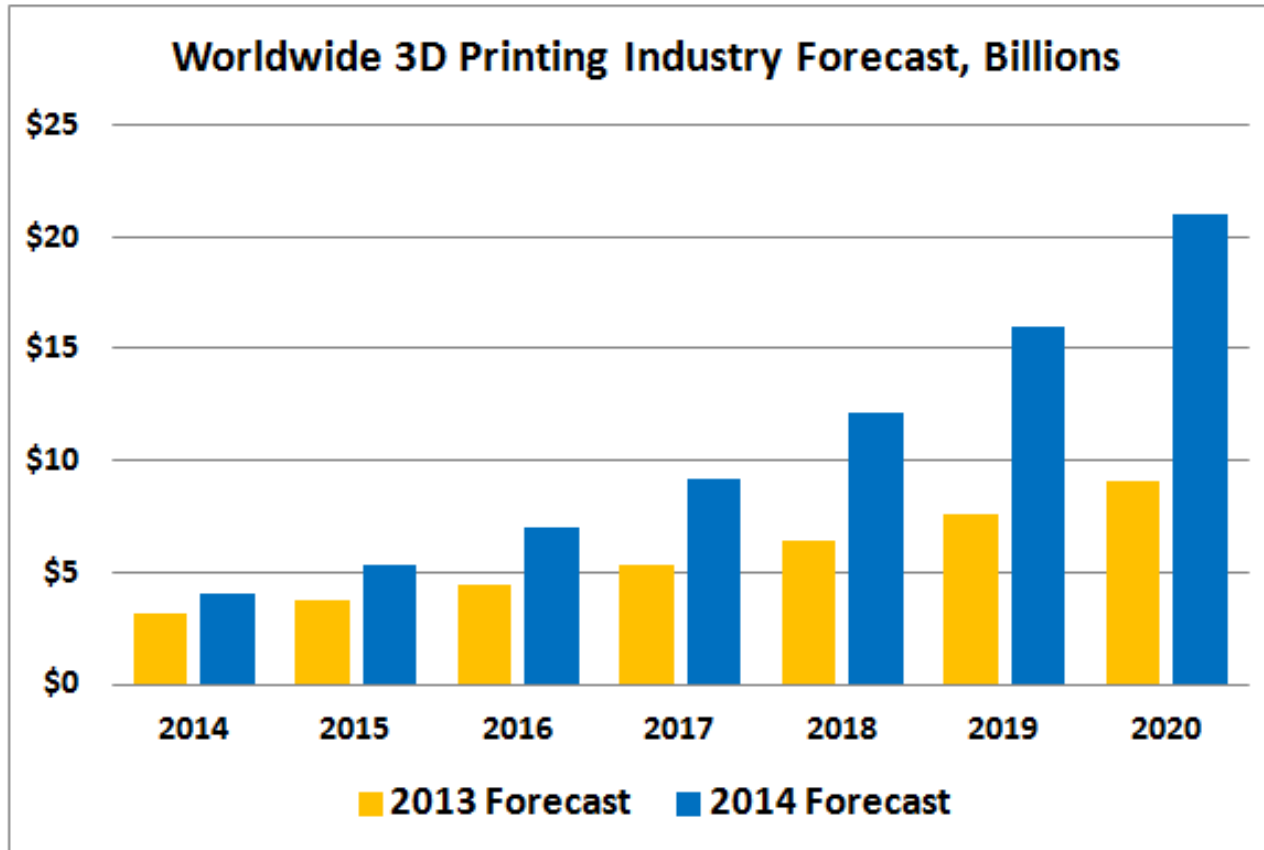
*IDC Special Study – WW 3D Printer 2012-2017 Forecast and Vendor Shares, #244304, November 2013



© IDC 2014

SOURCE: IDC.

3D Printing Industry Forecast



SOURCE: WOHLERS ASSOCIATES, AUTHOR'S CALCULATION.

The Automated Cooking Problem



1 hour saved
every day

New 'Lost Generation': The Cooking Illiterate

By TRISH HALL

Food marketers and researchers say that despite the desire to cook, the cooking skills of Americans have declined precipitously.

In the last decade, cooking has evolved into an optional activity, like skiing or playing chess. Many young adults never learned how to cook, or they simply don't bother, because there are so many other choices, like fast food, takeout or frozen dishes that can be microwaved.

Today's young adults haven't
learnt much cooking 😞



but don't know
how to cook it
😞